

1                                    **DIVISION 600 - MISCELLANEOUS CONSTRUCTION**

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4                                    **SECTION 601 - STRUCTURAL CONCRETE**

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7    **601.01 Description.** This section describes structural concrete consisting of  
8 portland cement, fine aggregate, coarse aggregate, and water. This will include  
9 adding admixtures for the purpose of entraining air, retarding or accelerating set,  
10 tinting, and other purposes as required or permitted.

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12    **601.02 Materials.**

13	Portland Cement	701.01
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15	Fine Aggregate for Concrete	703.01
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17	Coarse Aggregate for Portland Cement Concrete	703.02
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19	Admixtures	711.03
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21	Water	712.01
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24                    Use coarse aggregate for lightweight concrete conforming to ASTM C 330  
25 except Sections 5, 7 and 9.

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27    **601.03 Construction.**

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29                    **(A) Quality Control.** Portland cement concrete production requires  
30 Contractor responsibility for quality control of materials during handling,  
31 blending, mixing, curing, and placement operations.

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33                    Sample, test, and inspect concrete to ensure quality control of  
34 component materials and concrete. Sampling and testing for quality control  
35 in accordance with standard methods shall be performed by certified ACI  
36 Concrete Field Technician Grade I. Perform quality control tests for slump,  
37 air content, temperature, and unit weight during production of structural  
38 concrete other than concrete for incidental construction. Submit quality  
39 control test results.

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41                    **(B) Design and Designation of Concrete.** Design concrete mixture for  
42 concrete work specified. When requested by the Engineer, submit mix  
43 designs using State Highways Division form DOT 4-151. Do not start work  
44 until the Engineer accepts mix design. The Engineer will accept concrete mix  
45 design using information given in Table 601.03-1 - Design of Concrete, and  
46 other pertinent requirements.

### 601.03

48                   Whenever 28-day compressive strength,  $f'_c$ , is 4,000 psi or greater,  
49 designate concrete by required minimum 28-day compressive strength.

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51                   The 28-day compressive strength,  $f'_c$ , less than 4,000 psi listed in  
52 Table 601.03-1 – Design of Concrete, is for design information and  
53 designation of class only. It is not a requirement for acceptance of concrete.

54

55                   Proportion concrete designated by compressive strength such that  
56 concrete conforms to required strength.

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58                   Design concrete placed in bridge decks and pavements exposed to  
59 traffic wear, with air content of 3 percent, including entrapped and entrained  
60 air. Maintain air content for plastic concrete within tolerance of 1 percent,  
61 plus or minus, during the work.

62

63                   Use class BD concrete in bridge deck unless concrete is designated  
64 by compressive strength. Incorporate water-reducing and set-retarding  
65 admixture into concrete, with capability of varying degree of retardation  
66 without adversely affecting other characteristics of concrete. Submit design  
67 admixture dosage.

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69                   When type of concrete is not indicated in the contract documents, use  
70 Class A concrete.

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Design concrete as specified in Table 601.03-1 – Design of Concrete.

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<b>TABLE 601.03-1 - DESIGN OF CONCRETE</b>			
<b>Class of Concrete</b>	<b>28-Day Strength <math>f'_c</math>, psi</b>	<b>Minimum Cement Content lbs./c.y. (800 Maximum)</b>	<b>Maximum Water-Cement Ratio, lb./lb.</b>
A	3000	560	0.55
B	2500	500	0.62
C	2000	440	0.71
D	1500	400	0.80
BD	3750	610	0.49
SEAL	3000	610	0.55
Designated by Strength $f'_c$ or $f'_r$	As Specified	610	0.49
$f'_r$ = Specified Modulus of Rupture			

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Proportion concrete materials in accordance with requirements of concrete designated by class, cement content in pounds per cubic yards, or specified 28-day compressive strength, using absolute volume method. Use volumetric proportioning methods as outlined in the American Concrete Institute (ACI) Standard 211.1, "Recommended Practices for Selecting Proportions for Normal and Heavyweight Concrete."

Use coarse aggregate size No. 57 (one inch to No. 4) or No. 67 (3/4 inch to No. 4) for concrete. For concrete placed in bottom slabs and stems of box girders, use No. 67 size aggregate. If accepted by the Engineer in writing, smaller size aggregates are permitted when encountering limited space between forms and reinforcement.

Use the following standard methods in Table 601.03-2 – Standard Methods for determining compliance with requirements indicated in this subsection:

<b>TABLE 601.03-2 – STANDARD METHODS</b>	
Sampling Fresh Mixed Concrete	AASHTO T 141
Mass Per Cubic Meter (Cubic Foot) Yield and Air Content (Gravimetric) of Concrete	AASHTO T 121
Slump of Hydraulic Cement Concrete	AASHTO T 119
Air Content of Freshly Mixed Concrete by the Pressure Method	AASHTO T 152
Specific Gravity and Absorption of Fine Aggregate	AASHTO T 84
Specific Gravity and Absorption of Coarse Aggregate	AASHTO T 85
Temperature of Freshly Mixed Portland Cement Concrete	ASTM C 1064
Making and Curing Concrete Test Specimens in the Field	AASHTO T 23
Compressive Strength of Molded Concrete Cylindrical Specimens	AASHTO T 22(6 inch by 12 inch cylinders only)
Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)	AASHTO T 97

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When concrete is designated by compressive strength,  $f'_c$ , or flexural strength,  $f'_r$ , the Engineer will require prequalification of materials and mix proportions proposed for use before placing such concrete. The Engineer will prequalify concrete based on past performance records using statistical computations of population sizes and (n-1) weighting, or trial batch test reports in compliance with computed minimum average strength for material and mix proportions. The Engineer will determine minimum average strength on probability of not more than one in 20 tests falling below specified strength for the following conditions:

(1) When past performance records are available, furnish the following documented performance records:

(a) Minimum of 15 consecutive 28-day strength tests from projects having same materials and mix proportions.

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**(b)** Two groups totaling 30 or more test results representing similar materials in which mix proportion strengths are within 20 percent of specified strength, from data obtained within one year of proposed use.

The Engineer will analyze performance records to establish standard deviation.

**(2)** When sufficient past performance records are not provided, the Engineer will assume current standard deviation to be 500 psi for compressive strength,  $f'_c$ , and 50 psi for flexural strength,  $f'_r$ .

Unless sufficient performance records are available from other projects at DOT Materials Testing and Research Branch, submit test performance records or trial test reports for prequalifications, based on data of most recent tests made on concrete of proposed mix design, and data obtained within one year of proposed use.

Include the following information in test data and trial batch test reports: date of mixing; mixing equipment and procedures used; size of batch in cubic yards and weight, type, and source of ingredients used; slump of concrete; air content of concrete when using air entraining agent; age at time of testing; and strength of concrete cylinders tested.

Show that concrete strength tests equal or exceed minimum average strength in trial test reports. Test is average 28-day test results of five consecutive concrete cylinders or concrete beams taken from single batch. No cylinder or beam shall have strength less than 85 percent of minimum average strength.

Submit test data and trial test reports signed by official of firm that performed tests.

The Engineer reserves the right to stop work when a series of low strength tests occur. Do not continue concrete work until cause is established and the Engineer is informed of and accepts, necessary corrective action to be taken.

**(C) Batching.** Measure and batch materials in accordance with the following provisions:

**(1) Portland Cement.** Either sacked or bulk cement may be used. Do not use fraction of sack of cement in concrete batch unless cement is weighed.

Weigh bulk cement on weighing device accepted by the Engineer. Seal and vent bulk cement-weighing hopper properly to

156 preclude dusting during operation. Do not suspend discharge chute  
157 from weighing hopper. Arrange discharge chute so that cement will  
158 not lodge in hopper or leak from hopper.

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160           Batching accuracy shall be within 1 percent, plus or minus, of  
161 required weight.

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163 **(2) Water.** Measure water by volume or by weight. Use readily  
164 adjustable device for measurement of water, with accuracy within 1  
165 percent, plus or minus, of quantity of water required for batch.  
166 Arrange device so that variable pressure in water supply line does not  
167 affect measurements. Equip measuring tanks with outside taps and  
168 valves or other accepted means to allow for checking calibration.

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170 **(3) Aggregates.** When storing and stockpiling aggregates, avoid  
171 separation of coarse and fine particles within each size, and do not  
172 intermix various sizes before proportioning. Protect stored or  
173 stockpiled aggregates from dust or other foreign matter. Do not  
174 stockpile together, aggregates from different sources and of different  
175 gradations.

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177           When transporting aggregates from stockpiles or other sources  
178 to batching plant, ensure uniform grading of material is maintained.  
179 Do not use aggregates that have become segregated or mixed with  
180 earth or foreign matter. Stockpile or bin aggregates at least 12 hours  
181 before batching. Produce or handle aggregates by hydraulic methods  
182 and wash and drain aggregates. If aggregates exhibit high or  
183 non-uniform moisture content, the Engineer will order storage or  
184 stockpiling for more than 12 hours.

185

186           Proportion aggregates by weight, with the exception that  
187 aggregates in concrete for minor structures, curbs, and sidewalks may  
188 be proportioned by either volume or weight. For volumetric  
189 proportioning, use measuring boxes of known capacity to measure  
190 quantity of each aggregate size.

191

192           Use batch weight based on dry materials plus total weight of  
193 moisture (both absorbed and surface) contained in aggregate.  
194 Measure individual aggregates to within 2 percent, plus or minus, of  
195 required weight, and total weight of aggregates to within 1 percent,  
196 plus or minus, of required weight.

197

198 **(4) Admixtures.** Store, proportion, and dispense admixtures in  
199 accordance with the following provisions:

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201 **(a) Liquid Admixtures.** Dispense chemical admixtures, air  
202 entraining admixtures, and corrosion inhibiting admixtures in  
203 liquid form. Use mechanical dispensers for liquid admixtures

204 with sufficient capacity to measure prescribed quantity for each  
205 batch of concrete. Include graduated measuring unit in each  
206 dispenser to measure liquid admixtures to within 5 percent,  
207 plus or minus, of prescribed quantity for each batch. Read  
208 graduations accurately from point of measuring unit, and  
209 control proportioning operations to permit visual check of batch  
210 accuracy before discharging. Mark each measuring unit clearly  
211 for type and quantity of admixture.

212  
213           Arrange with supplier to provide sampling device  
214 consisting of valve located in safe and accessible location for  
215 sampling admixtures.

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217           When using more than one liquid admixture for concrete  
218 mix, use separate measuring unit for each liquid admixture and  
219 dispense separately to avoid interaction that may interfere with  
220 admixture efficiency and adversely affect concrete. Dispense  
221 liquid admixture by injecting so as not to mix admixture at high  
222 concentrations.

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224           When using liquid admixtures in concrete that is  
225 completely mixed in paving or continuous mixers, operate  
226 dispensers automatically with batching control equipment.  
227 Equip such dispensers with automatic warning system that will  
228 provide visible or audible signals at point where proportioning  
229 operations are controlled, when the following occurs: quantity  
230 of admixture measured for each batch of concrete varies from  
231 pre-selected dosage by more than 5 percent; or entire contents  
232 of measuring unit from dispenser is not emptied into each  
233 batch of concrete.

234  
235           Unless liquid admixtures are added to batch with  
236 pre-measured water, discharge liquid admixtures into stream of  
237 water that disperses admixtures uniformly throughout batch.  
238 An exception is that air-entraining admixtures may be  
239 dispensed directly into moist sand in batching bins, provided  
240 adequate control of concrete air content can be maintained.

241  
242           Measure and disperse special admixtures, as  
243 recommended by admixture manufacturer, and as accepted by  
244 the Engineer. Special admixtures include high-range water  
245 reducers requiring dosages greater than capacity of  
246 conventional dispensing equipment. For site-added, high-  
247 range water reducers, use calibrated, portable dispenser  
248 supplied by manufacturer.

249  
250 **(b) Mineral Admixtures.** Protect mineral admixtures from  
251 exposure to moisture until used. Pile sacked material of each

## 601.03

252 shipment to permit access for tally, inspection, and  
253 identification.

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Provide adequate facilities to ensure that mineral admixtures meeting specified requirements are kept separate from other mineral admixtures and that only specified mineral admixtures are allowed to enter into the work. Provide safe and suitable facilities for sampling mineral admixtures at weigh hopper or in feed line immediately in advance of hopper.

Incorporate mineral admixtures into concrete using equipment conforming requirements for portland cement weigh hoppers, and charging and discharging mechanisms specified in ASTM C 94 and Subsection 601.03(C) - Batching.

When concrete is completely mixed in stationary paving or continuous mixers, weigh mineral admixture in separate weigh hopper. Introduce mineral admixture and cement simultaneously into mixer, proportionately with aggregate.

When interlocks are required for cement-charging mechanisms, and cement and mineral admixtures are weighed cumulatively, interlock their charging mechanisms to prevent introduction of mineral admixture until mass of cement in weigh hopper is within tolerances specified in Subsection 601.03(C)(1) - Portland Cement.

In determining maximum quantity of free water that may be used in concrete, consider mineral admixture to be cement.

**(5) Bins and Scales.** At batching plant, use individual bins, hoppers, and scale for each aggregate size. Include separate bin, hopper, and scale for bulk cement and fly ash.

Except when proportioning bulk cement for pavement or structures, cement weigh hopper may be attached to separate scale for individual weighing or to aggregate scale for cumulative weighing. If cement is weighed cumulatively, weigh cement before other ingredients.

When proportioning for pavement or structures, keep bulk cement scale and weigh hopper separate and distinct from aggregate weighing equipment.

Use springless-dial or beam-type batching scales. When using beam-type scales, make provisions to show operator that required

298 load in weighing hopper is approaching. Use devices that show  
299 condition within last 200 pounds of load and within 50 pounds of  
300 overload.

301  
302 Maintain scale accuracy to 0.5 percent throughout range of  
303 use. Design poises to lock to prevent unauthorized change of  
304 position. Use scales inspected by the State Measurement Standards  
305 Branch of the Department of Agriculture to ensure their continued  
306 accuracy. Provide not less than ten 50-pound weights for testing  
307 scales.

308  
309 Batching plants may be equipped to proportion aggregates and  
310 bulk cement by automatic weighing devices.

311  
312 **(6) Batching and Hauling.** When mixing is to be performed at  
313 work site, transport aggregates from batching plant to mixer in batch  
314 boxes, vehicle bodies, or other containers of adequate capacity and  
315 construction. Use partitions to separate batches and prevent spilling  
316 from one compartment to another while in transit or during dumping.

317  
318 Transport bulk cement to mixer in tight compartments carrying  
319 full quantity of cement required for batch. Once cement is placed in  
320 contact with aggregates, batches shall be mixed and placed within  
321 1-1/2 hours of contact. Cement in original shipping packages may be  
322 transported on top of aggregates. Ensure that each batch contains  
323 number of sacks required by job mix.

324  
325 Deliver batches to mixer intact. Charge each batch into mixer  
326 without loss of cement. When carrying more than one batch on truck,  
327 charge batch into mixer without spilling material from one batch  
328 compartment into another.

329  
330 **(D) Mixing.** Mix concrete in mechanically operated mixers. When  
331 accepted by the Engineer, batches not exceeding 1/3 cubic yard may be  
332 hand mixed in accordance with methods described at end of this subsection.

333  
334 Use stationary or truck mixers that distribute materials thoroughly and  
335 produce concrete uniform in color and appearance. When there is variation  
336 in mixed concrete attributable to worn pickup or throw-over blades, the  
337 Engineer will inspect mixer. If inspection reveals that blades are worn more  
338 than one inch below original height of manufacturer's design, repair or  
339 replace blades. Upon request, make copy of manufacturer's design, showing  
340 dimensions and arrangement of blades.

341  
342 Charge batches into central or truck mixers so that portion of mixing  
343 water enters ahead of cement and aggregates. Deliver uniform flow of water.  
344 Place entire amount of batch water in mixer by end of first quarter of mixing  
345 period. When mixers with multiple compartment drums are used, time

## 601.03

346 required to transfer material between compartments will be included as  
347 mixing time. Use drum rotation speed as designated by manufacturer. If  
348 mixing does not produce concrete of uniform and smooth texture, provide  
349 additional revolutions at same speed until thorough mixing of each concrete  
350 batch is attained. Begin measuring mixing time from time cement,  
351 aggregates, and 60 percent of water are in drum. Do not exceed  
352 manufacturer's rated capacity for volume of concrete mixed in each batch.  
353

354 Equip central or truck mixers with attachment for automatically timing  
355 mixing of each concrete batch. Timing device shall include automatic feature  
356 for locking discharge chute and device for warning operator when required  
357 mixing duration has been met. If timing or locking device fails to operate,  
358 immediately furnish clock or watch that indicates seconds, to mixer operator.  
359 If timing device is not repaired within three days after becoming inoperative,  
360 shut down batching operation until timing device is repaired.  
361

362 For stationary mixers, use mixing time between 50 seconds and 5  
363 minutes. Select mixing time, as necessary, to produce concrete that meets  
364 uniformity criteria when tested in accordance with Section 11.3.3 of ASTM  
365 C 94. The Contractor may designate mixing time for which uniformity tests  
366 are to be performed, provided mixing time is not less than 50 seconds or  
367 more than 5 minutes. Before using concrete for pavements or structures, mix  
368 concrete to meet specified uniformity requirements. The Contractor shall  
369 furnish labor, sampling equipment, and materials required for conducting  
370 uniformity tests of concrete mixture. The Engineer will furnish required  
371 testing equipment, including scales, cubic measure, and air meter; and will  
372 perform tests. The Engineer will not pay separately for labor, equipment,  
373 materials, or testing, but will consider the costs incidental to concrete. After  
374 batching and mixing operational procedures are established, the Engineer  
375 will not allow changes in procedures without the Contractor re-establishing  
376 procedures by conducting uniformity tests. Repeat mixer performance tests  
377 whenever appearance of concrete or coarse aggregate content of samples is  
378 not conforming to requirements of ASTM C 94. For truck mixers, add four  
379 seconds to specified mixing time if timing starts as soon as skip reaches its  
380 maximum raised position.  
381

382 Unless otherwise indicated in the contract documents or accepted by  
383 the Engineer, concrete shall be mixed at proportioning plant. Operate mixer  
384 at agitating speed while in transit. Concrete may be truck-mixed only when  
385 cement or cement and mixing water are added at point of delivery. Begin  
386 mixing truck-mixed concrete immediately after introduction of mixing water to  
387 cement and aggregates, or introduction of cement to aggregates.  
388

389 Inclined-axis, revolving drum truck mixers shall conform to Truck  
390 Mixer, Agitator and Front Discharge Concrete Carrier Standards TMMB  
391 100-01, 15th Revision, published by Truck Mixer Manufacturers Bureau.

392 Truck mixers shall produce thoroughly mixed and uniform mass of concrete,  
393 and shall discharge concrete without segregation.

394

395 Manufacturer's standard metal rating plate shall be attached to each  
396 truck mixer, stating maximum rating capacity in terms of volume of mixed  
397 concrete for various uses; and maximum and minimum mixing speeds.  
398 When using truck mixers for mixing, adhere to maximum capacity shown on  
399 metal rating plate for volume of concrete in each batch.

400

401 Operate truck mixers at mixing speed designated by manufacturer, but  
402 at not less than 6 or more than 18 revolutions per minute. Mix truck-mixed  
403 concrete initially between 70 and 100 revolutions at manufacturer-designated  
404 mixing speed, after ingredients, including water, are in mixer. Water may be  
405 added to mixture not more than two times after initial mixing is completed.  
406 Each time that water is added, turn drum an additional 30 revolutions or more  
407 at mixing speed until concrete is mixed uniformly.

408

409 When furnishing shrink-mixed concrete, transfer partially mixed  
410 concrete at central plant to truck mixer. Apply requirements for truck-mixed  
411 concrete. The Engineer will not credit number of revolutions at mixing speed  
412 for partial mixing in central plant.

413

414 When accepted by the Engineer, concrete batches not exceeding 1/3  
415 cubic yard may be hand mixed on a watertight, level platform. Measure  
416 proper amount of coarse aggregate in measuring boxes and spread on  
417 platform. Spread fine aggregate on that coarse aggregate layer. Limit  
418 coarse and fine aggregate layers to total depth of one foot. Spread dry  
419 cement on this mixture. Turn whole mass not less than two times dry. Add  
420 sufficient clean water, distributed evenly. Turn whole mass again, not less  
421 than three times, not including placing in carriers or forms.

422

423 **(E) Transporting Mixed Concrete.** Transport central-mixed concrete to  
424 delivery point in truck agitators or truck mixers operating at speed designated  
425 by equipment manufacturer as agitating speed; or in non-agitating hauling  
426 equipment, provided consistency and workability of mixed concrete upon  
427 discharge at delivery point is suitable for placement and consolidation in  
428 place; and provided mixed concrete after hauling to delivery point conforms  
429 to uniformity criteria when tested as specified in Section 12.5 of ASTM C 94.

430

431 For revolving drum truck mixers transporting central-mixed concrete,  
432 limit concrete volume to manufacturer's rated capacity for agitator operation.  
433 Maintain agitating speed for both revolving drum mixers and revolving blade  
434 type agitators as designated on manufacturer's data plate. Equip truck  
435 mixers or truck agitators with electrically or mechanically actuated counters.  
436 Actuate counters after introducing cement to aggregates.

437

438 Bodies of non-agitating hauling equipment shall be smooth, watertight,  
439 metal containers equipped with gates to permit control of concrete discharge.

## 601.03

440 Protect open-topped haul vehicle against weather with cover accepted by the  
441 Engineer. When hauling concrete in non-agitating trucks, complete  
442 discharge within 30 minutes after introducing mixing water to cement and  
443 aggregates.  
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445 When truck mixer or agitator is used for transporting central-mixed  
446 concrete to delivery point, complete discharge within 1-1/2 hours, or before  
447 250 revolutions of drum or blades, whichever comes first after introduction of  
448 mixing water to cement and aggregates, or cement to aggregates. For truck-  
449 mixed concrete, complete concrete discharge within 1-1/2 hours, or before  
450 300 revolutions of drum or blades, whichever comes first. These limitations  
451 are permitted to be waived if concrete is of such slump after the 1-1/2 hour time  
452 or 300-revolution limit has been reached, that it can be placed, without  
453 addition of water to the batch.  
454

455 Submit delivery tickets from manufacturers of truck-mixed concrete  
456 and central-mixed concrete with each truckload of concrete before unloading  
457 at jobsite. Printed, stamped, or written delivery ticket shall include the  
458 following information:  
459

- 460 (1) Name of concrete plants.
- 461
- 462 (2) Serial number of ticket.
- 463
- 464 (3) Date and truck number.
- 465
- 466 (4) Name of Contractor.
- 467
- 468 (5) Specific project, route, or designation of job (name and  
469 location).
- 470
- 471 (6) Specific class or designation of concrete in accordance with  
472 contract documents.
- 473
- 474 (7) Quantity of concrete in cubic yards.
- 475
- 476 (8) Time of loading batch or mixing of cement and aggregates.
- 477
- 478 (9) Water added by receiver of concrete and receiver's initials.
- 479
- 480 (10) Information necessary to calculate total mixing water added by  
481 producer. Total mixing water includes free water on aggregates,  
482 water, and water added by truck operator from mixer tank.  
483
- 484 (11) Readings of non-resettable revolution counters of truck mixers  
485 after introduction of cement to aggregates, or introduction of mixing  
486 water to cement aggregates.  
487

488 (12) Supplier's mix number or code.

489

490 Furnish additional information designated by the Engineer and  
491 required by job specifications upon request.

492

493 **(F) Consistency.** Regulate quantity of water used in concrete mixes so  
494 that concrete consistency, as determined by AASHTO T 119 test method, is  
495 within nominal slump range specified in Table 601.03-3 - Slump for Concrete.

496 If concrete slump exceeds nominal slump, adjust mixture of subsequent  
497 batches. If slump exceeds maximum slump, the Engineer will reject concrete  
498 unless deemed satisfactory for its use.

499

500 The Engineer will also reject harsh or unworkable concrete that cannot  
501 be properly placed. Remove rejected concrete at no increase in contract  
502 price or contract time.

503

504 Slump for concrete shall be as specified in Table 601.03-3 – Slump for  
505 Concrete.

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<b>TABLE 601.03-3 - SLUMP FOR CONCRETE</b>		
<b>Type of Work</b>	<b>Nominal Slump Inches</b>	<b>Maximum Slump Inches</b>
Concrete Pavements	0 – 3	3-1/2
Reinforced Concrete Structures:		
Sections Over 12 Inches	0 – 4	5
Sections 12 Inches Thick or Less	2 – 5	6
Non-Reinforced Concrete Facilities	1 – 3	4
Concrete Placed Underwater	6 – 8	9
Bridge Decks	0 – 3	3-1/2

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508

509 In adverse or difficult conditions that may affect placement of concrete,  
510 the above slump limitations may be exceeded for placement workability, with  
511 the addition of admixture conforming to Subsection 711.03 - Admixtures, if  
512 accepted by the Engineer in writing and provided water-cement ratio is  
513 maintained. Provide additional cement and water, or admixture at no  
514 increase in contract price or contract time.

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**601.04**

515           **(G) Forms.** Construct forms in accordance with applicable sections.

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517           **(H) Placing Concrete.** Place concrete in accordance with applicable  
518 sections.

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520           **(I) Finishing Concrete Surfaces.** Finish concrete surfaces in  
521 accordance with applicable sections.

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523           **(J) Curing Concrete.** Cure concrete in accordance with applicable  
524 sections.

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526   **601.04 Measurement.** The Engineer will measure concrete in accordance with  
527 the applicable sections.

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529   **601.05 Payment.** The Engineer will pay for the accepted concrete under the  
530 applicable sections.

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**END OF SECTION 601**